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DeMario

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[45] **Date of Patent: Feb. 23, 1999**

[54] **WINDOW GATE APPARATUS**

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[21] Appl. No.: **705,809**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 386,156, Feb. 9, 1995, abandoned.

[51] **Int. Cl.**[6] **E05B 65/04**

[52] **U.S. Cl.** **49/67**; 49/394; 292/DIG. 65

[58] **Field of Search** ..... 49/67, 394, 141, 49/380, 63, 61; 292/37, 156, DIG. 65, 302; 52/588.1, 585.1, 587.1

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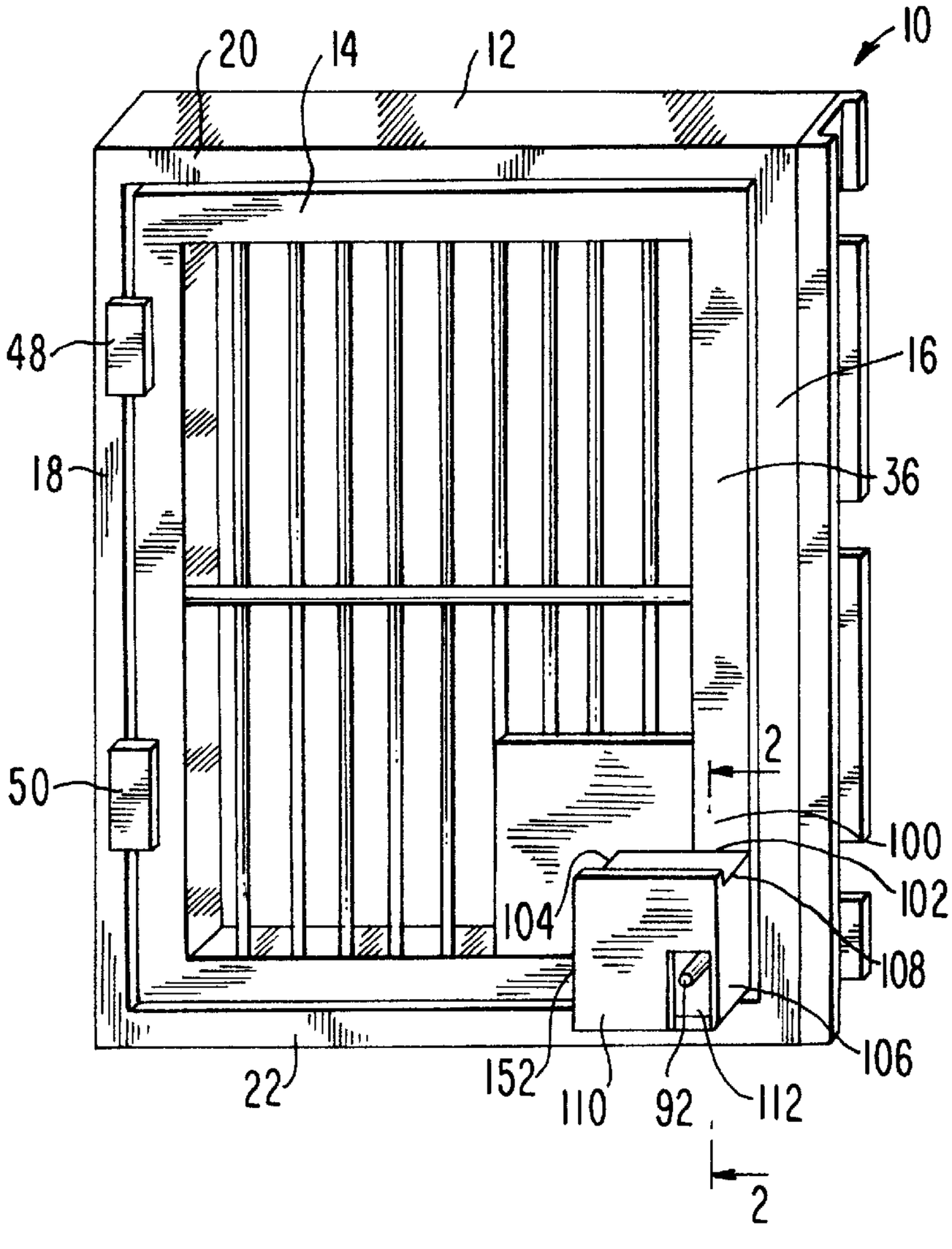
Primary Examiner—Kenneth J. Dorner
Assistant Examiner—Jerry Redman
Attorney, Agent, or Firm—Malina & Wolson

[57] **ABSTRACT**

An apparatus for preventing unwanted entry through the windows of a structure includes an outer frame which is fastened to the structure and an inner frame which is connected to the outer frame by a pair of hinges and by a lock assembly. The lock assembly includes a locking rail which is slideably mounted in a vertical member of the inner frame and which slides downward under the influence of gravity to a normally locked position in which portions of the locking rail engage a pair of T bolts which are mounted on the outer frame and which project into the vertical member of the inner frame. The locking rail includes a pivotally mounted pin which must be moved to a vertical position to unlock the inner frame.

12 Claims, 12 Drawing Sheets



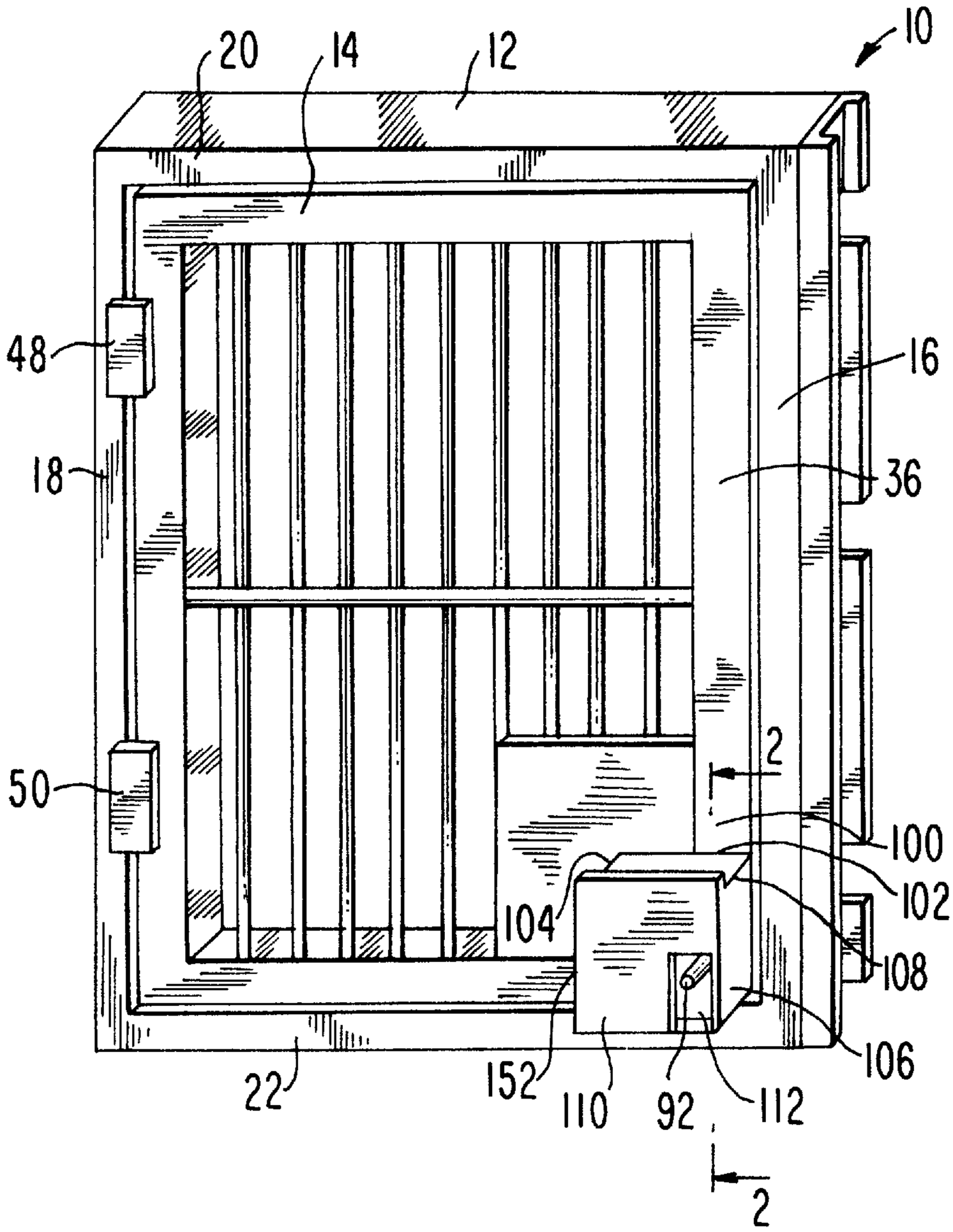


FIG. 1

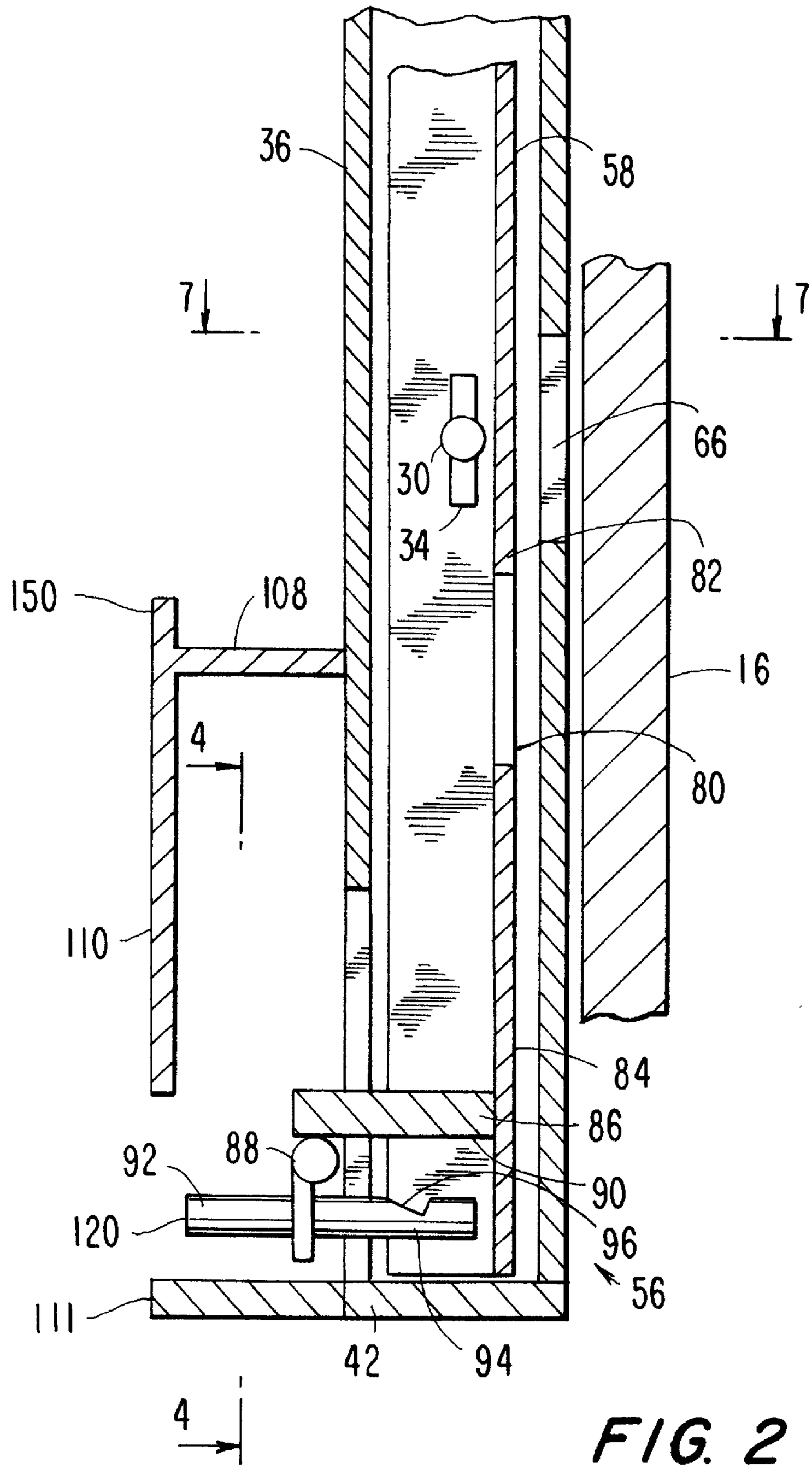

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FIG. 2

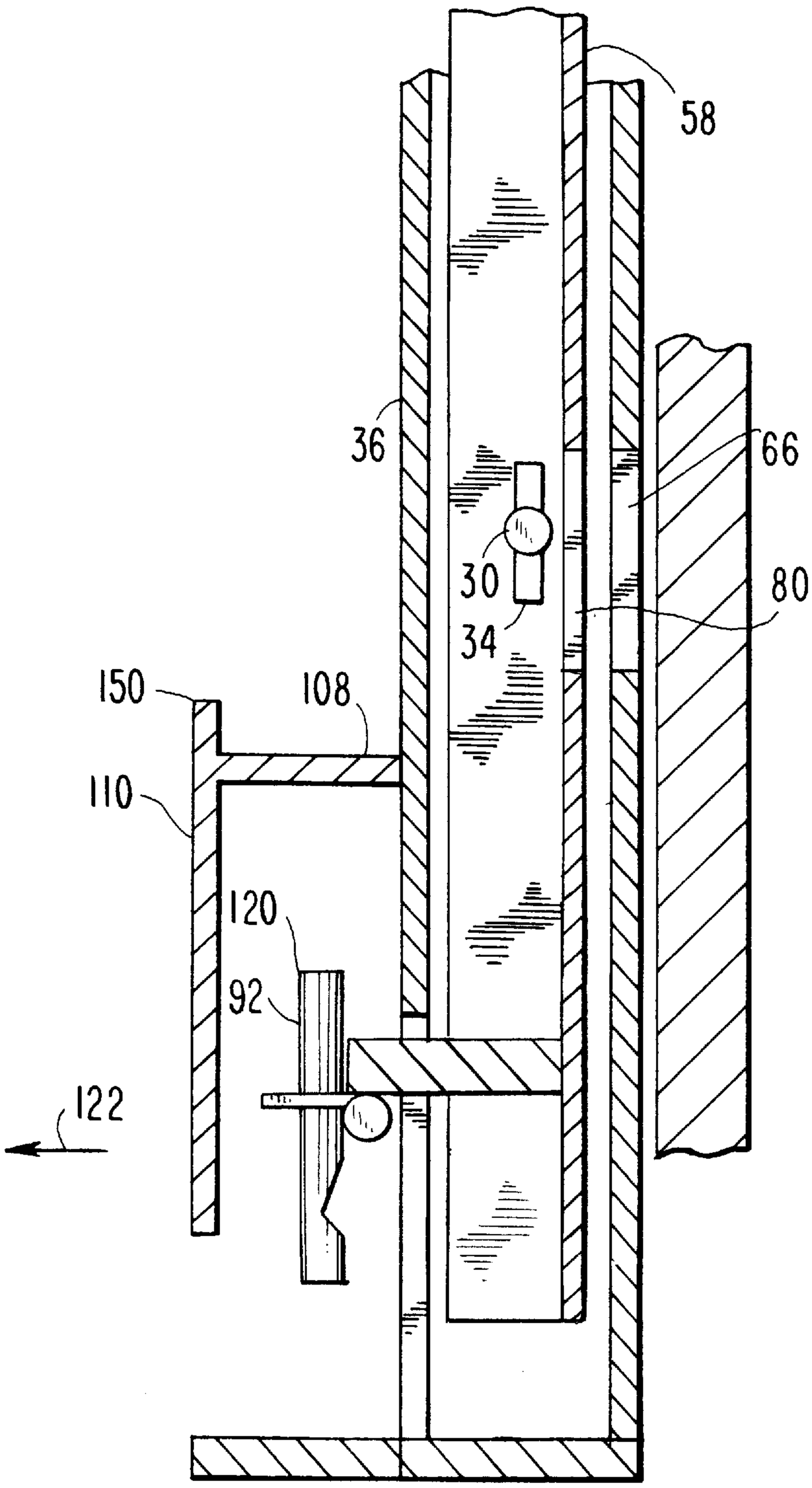


FIG. 3

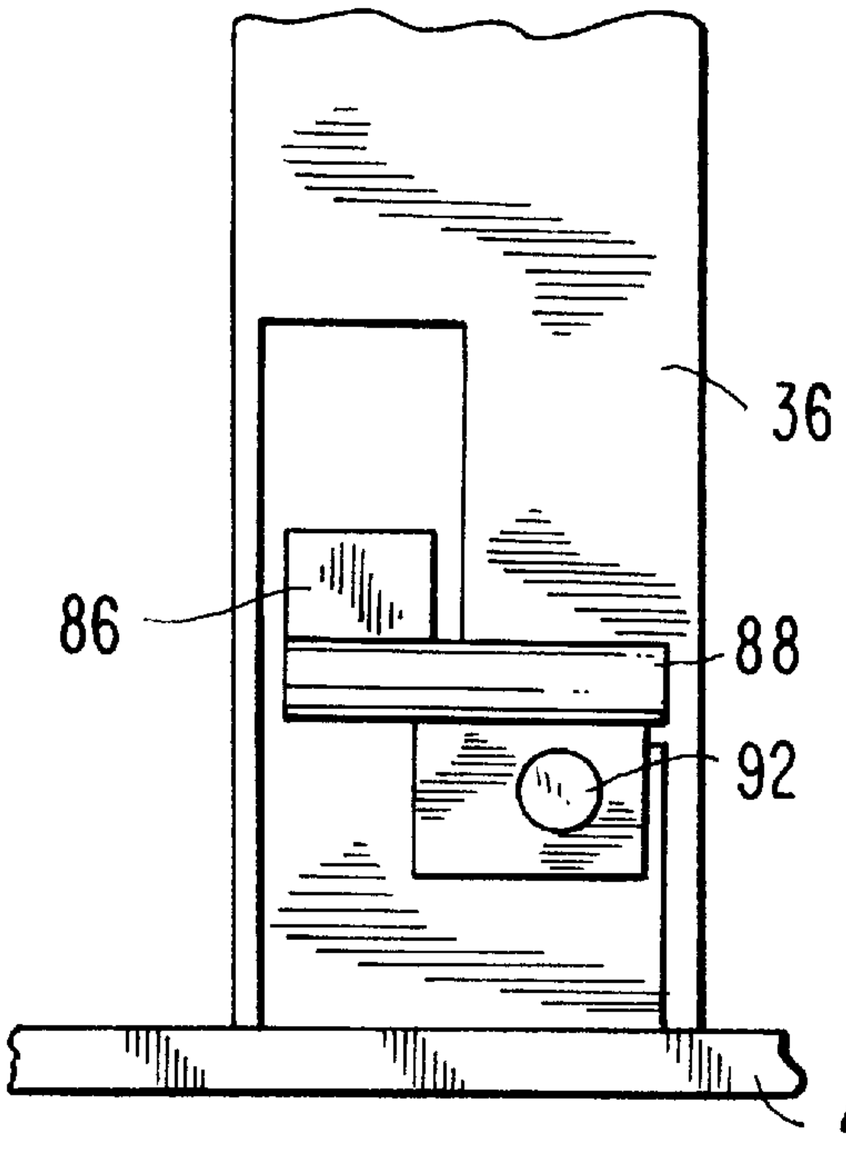


FIG.4

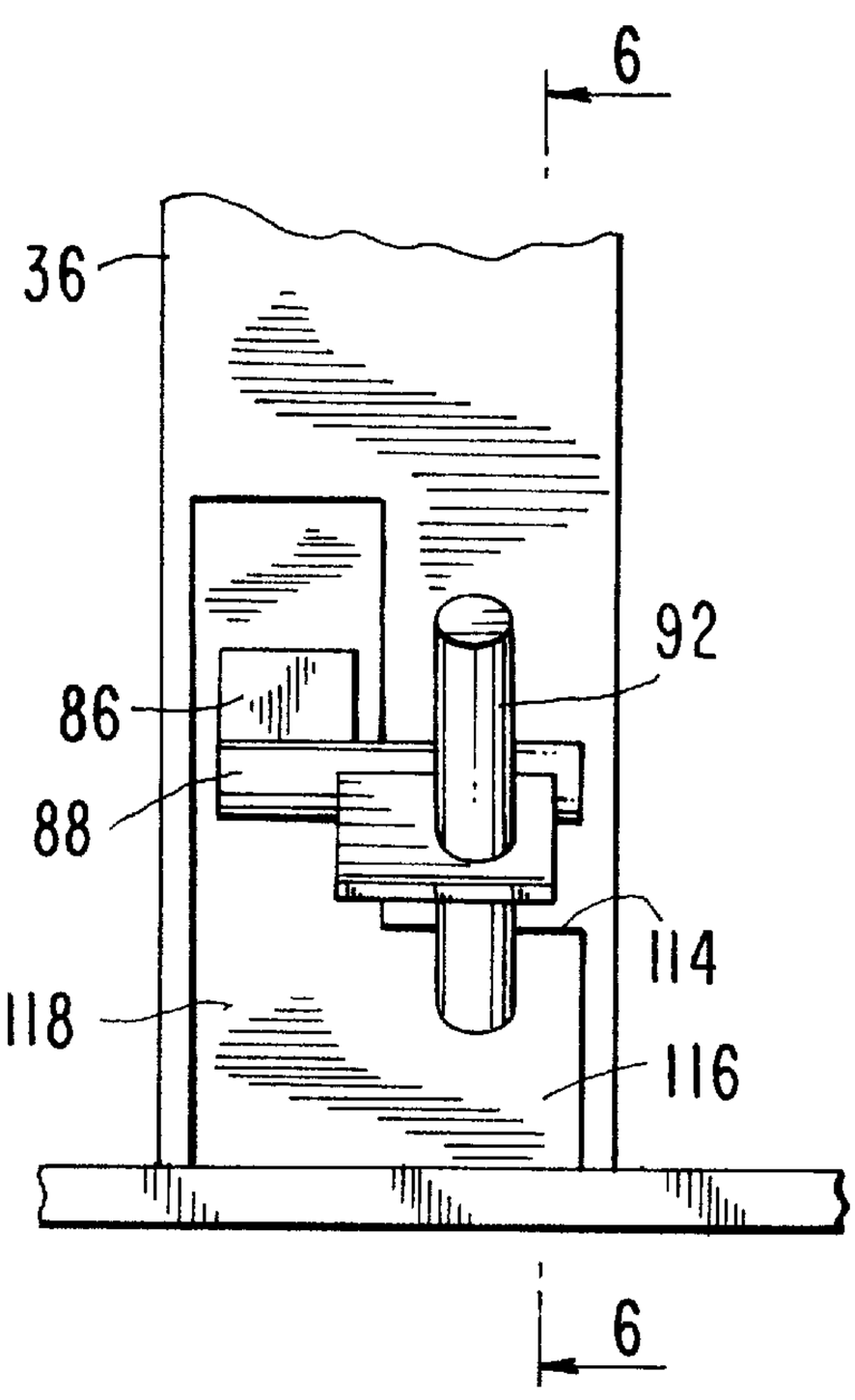


FIG.5

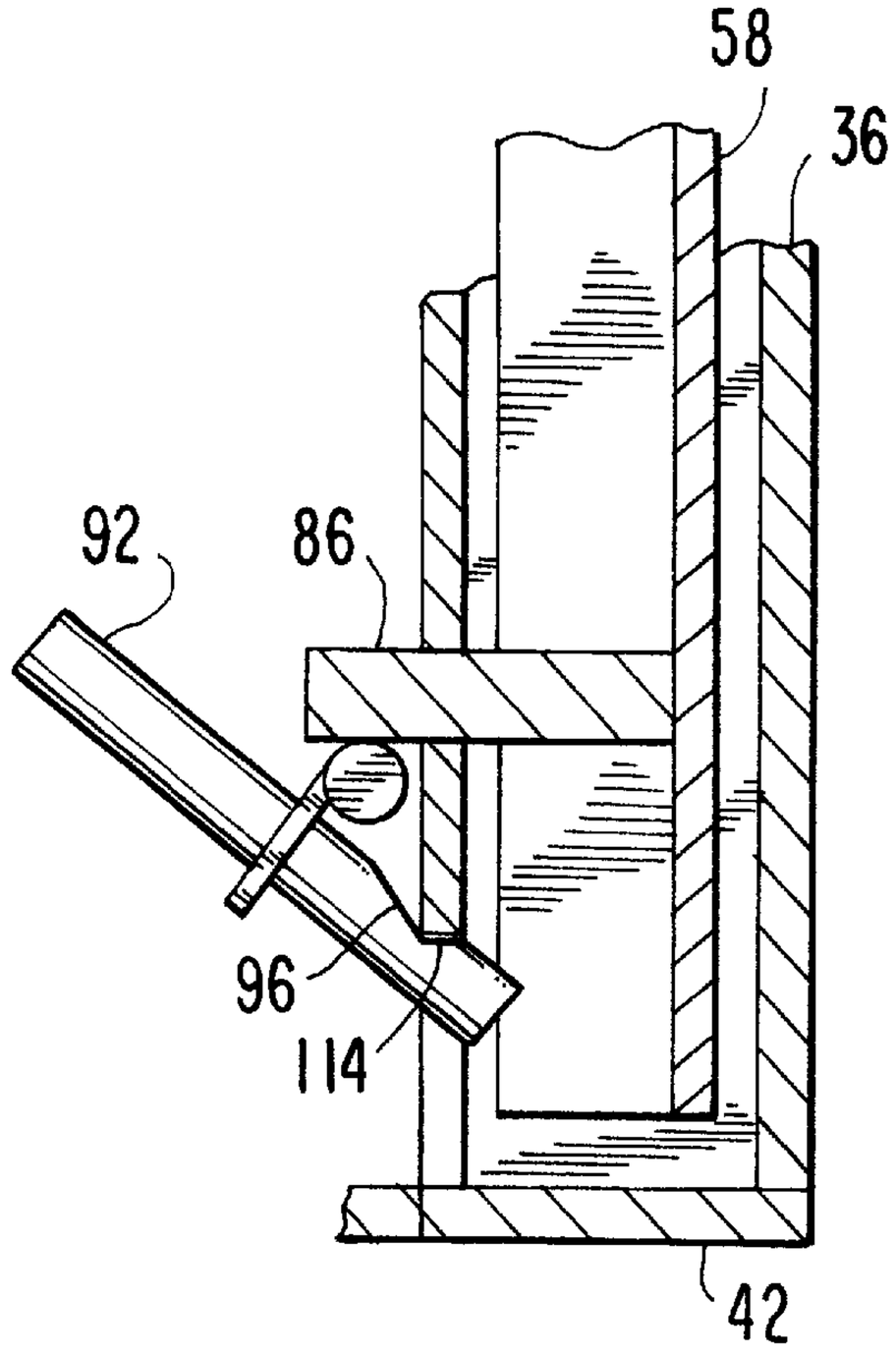


FIG.6

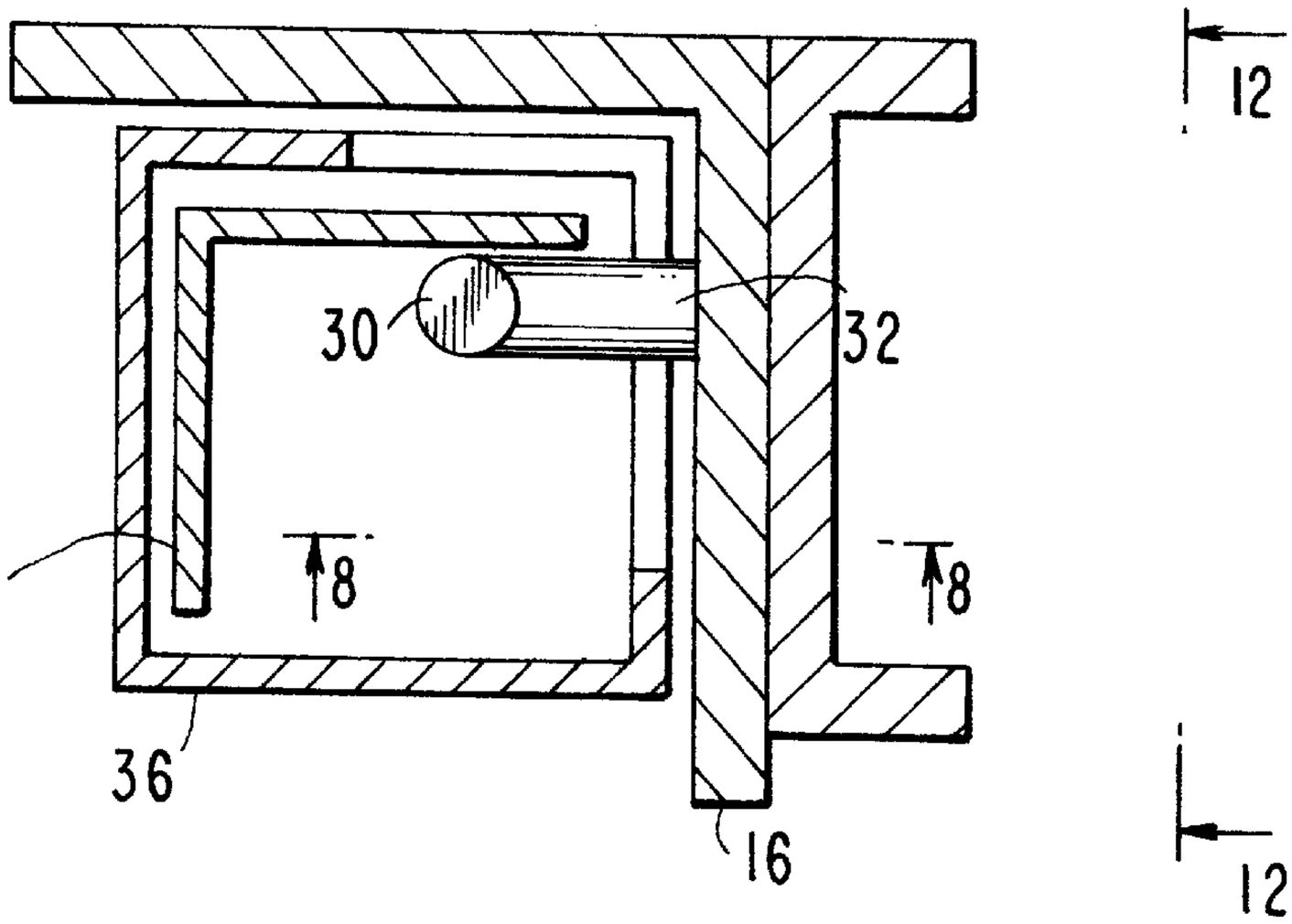


FIG. 7

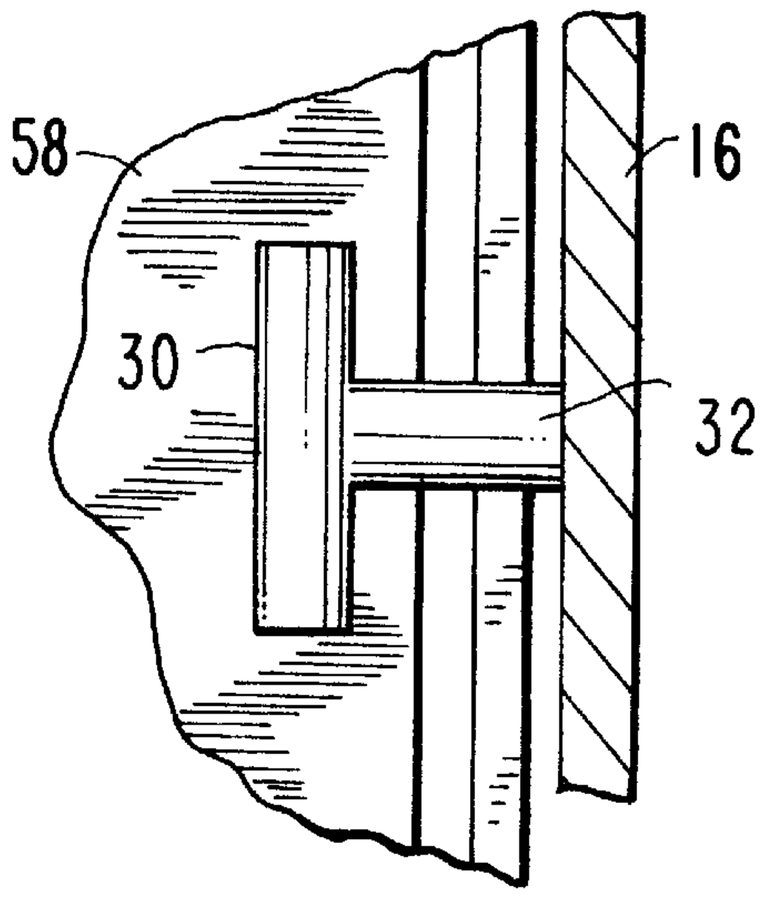


FIG. 8

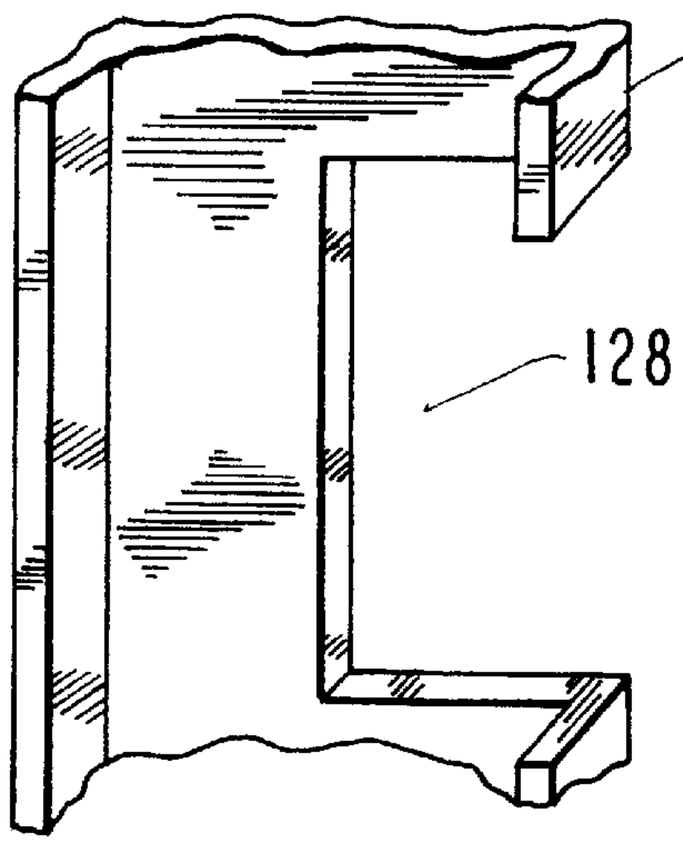


FIG. 12

FIG. 9

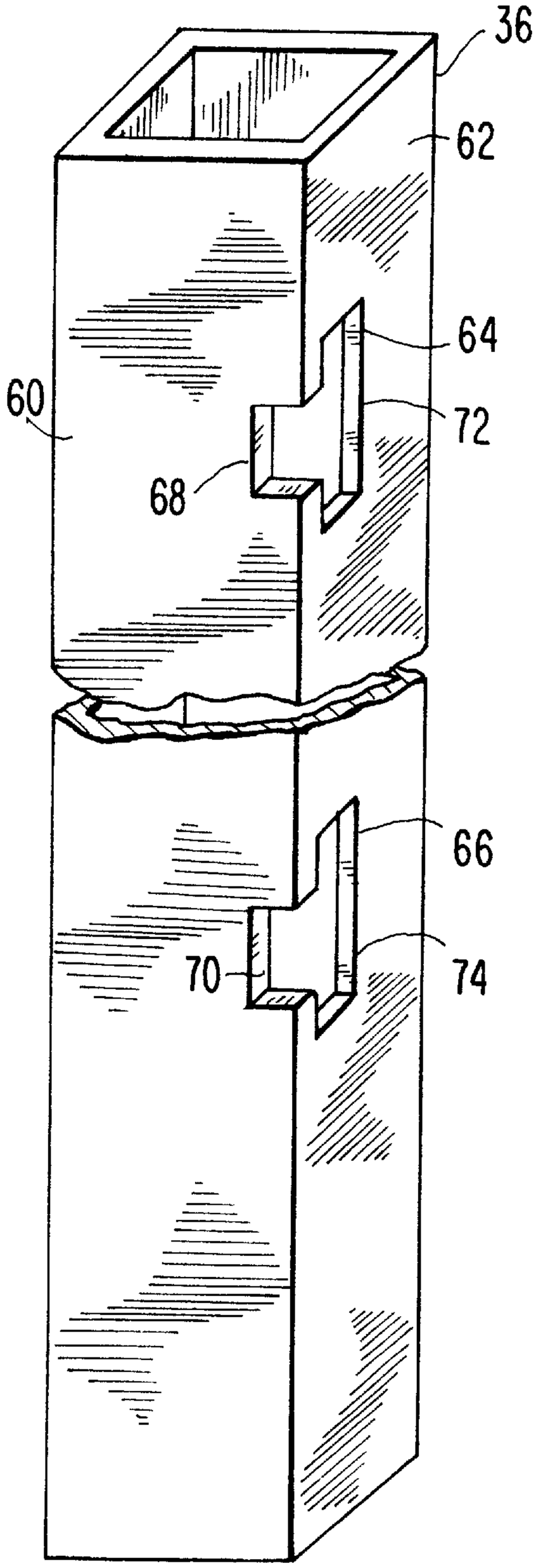
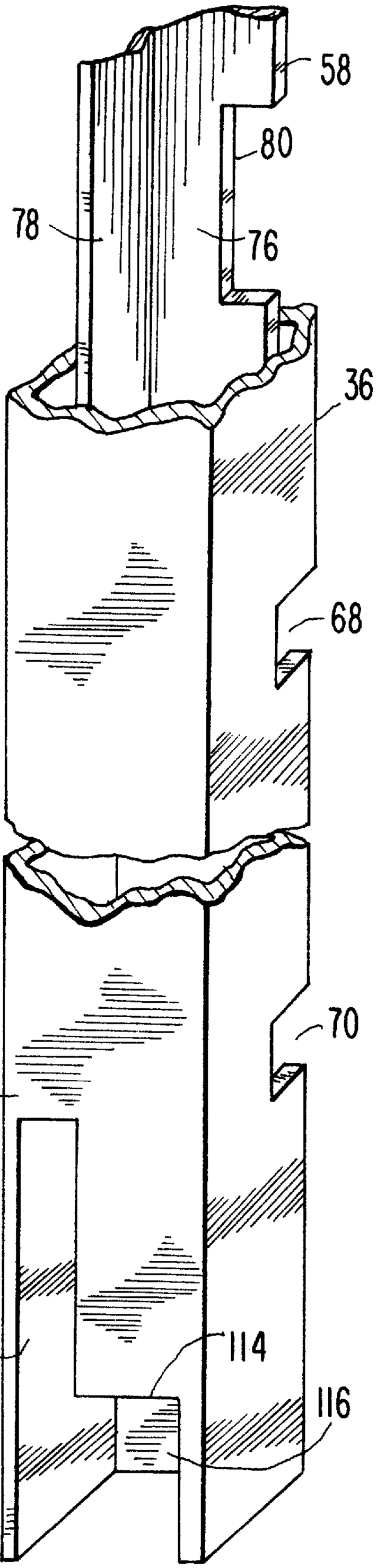


FIG. 10



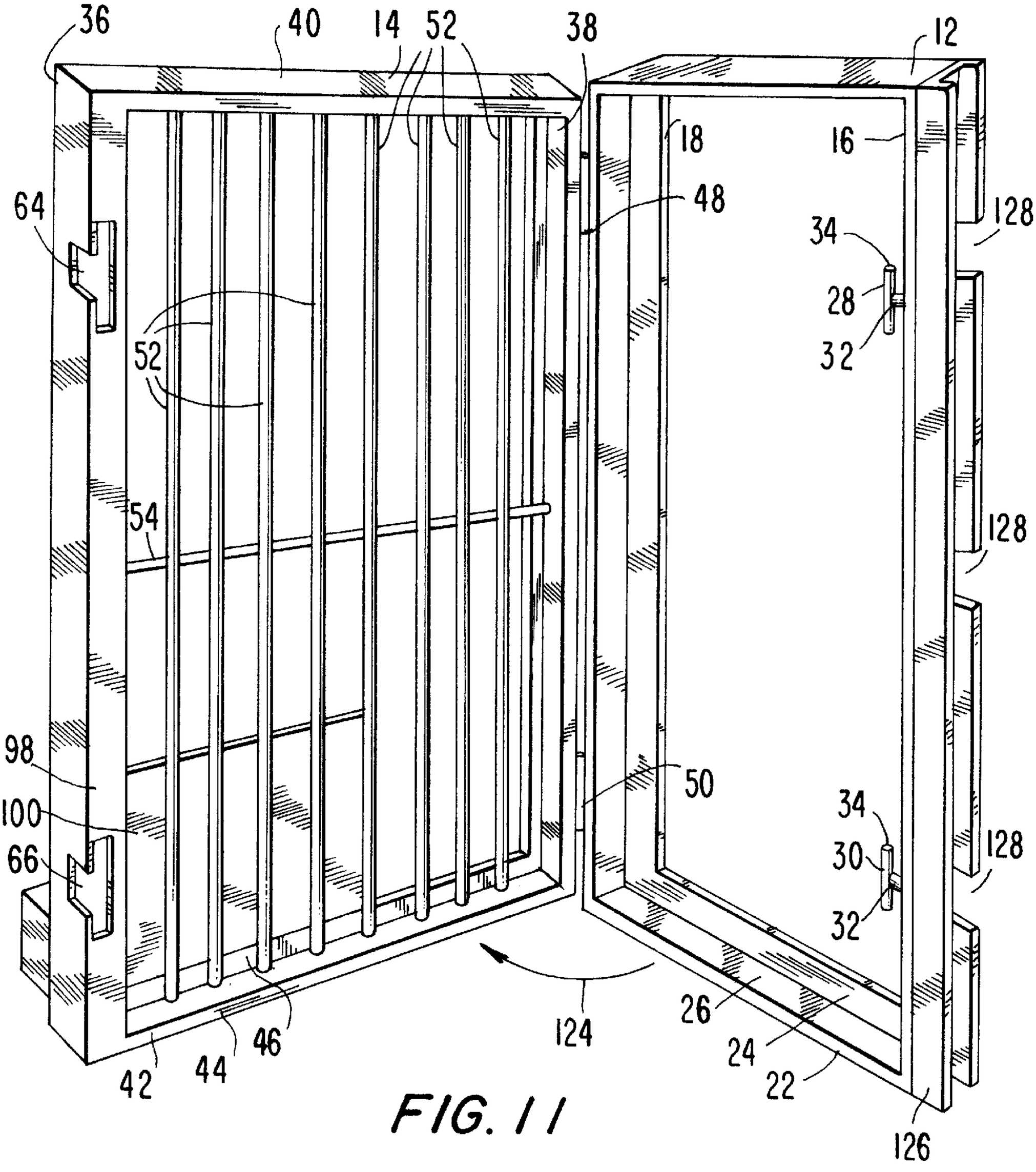

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FIG. 11

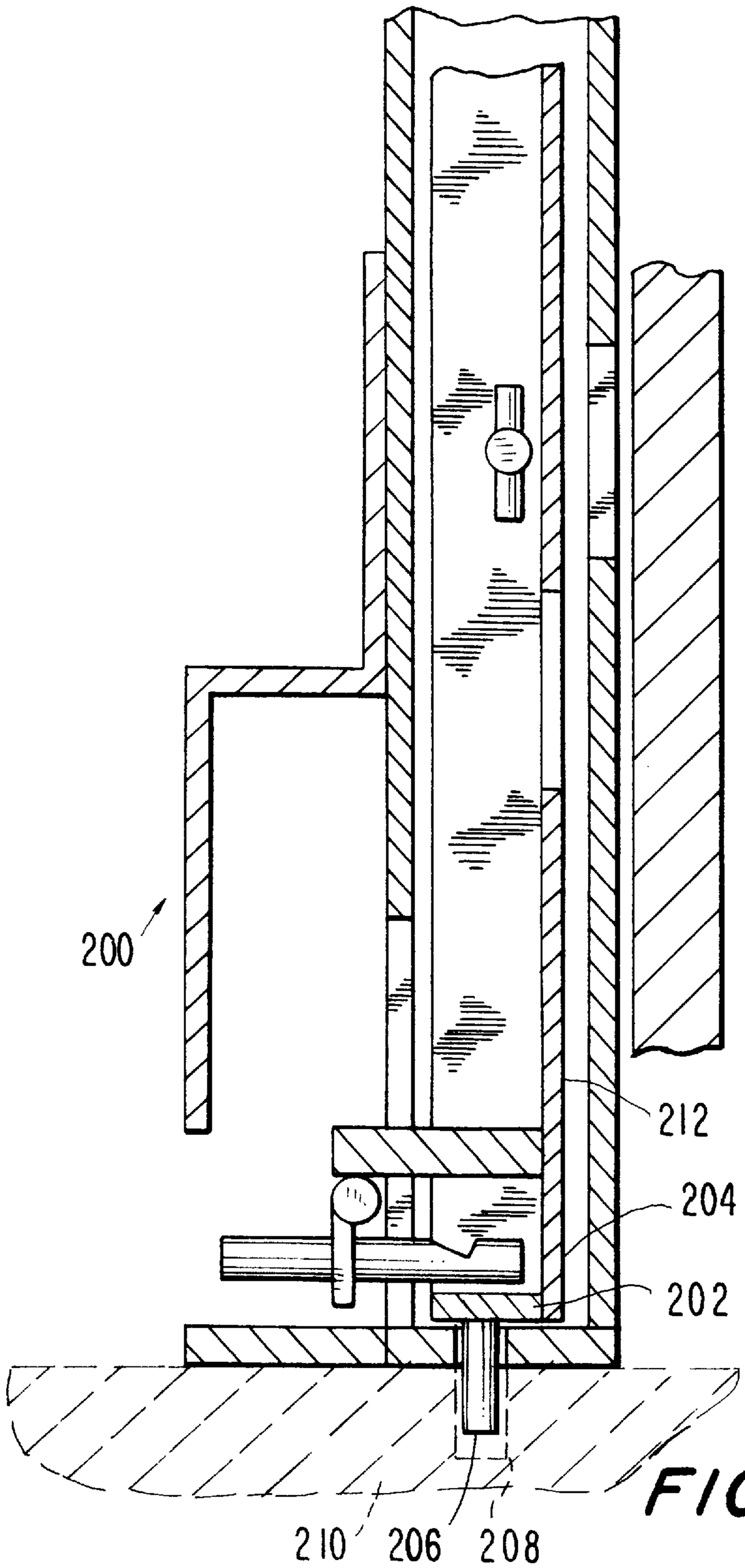

FIG. 13

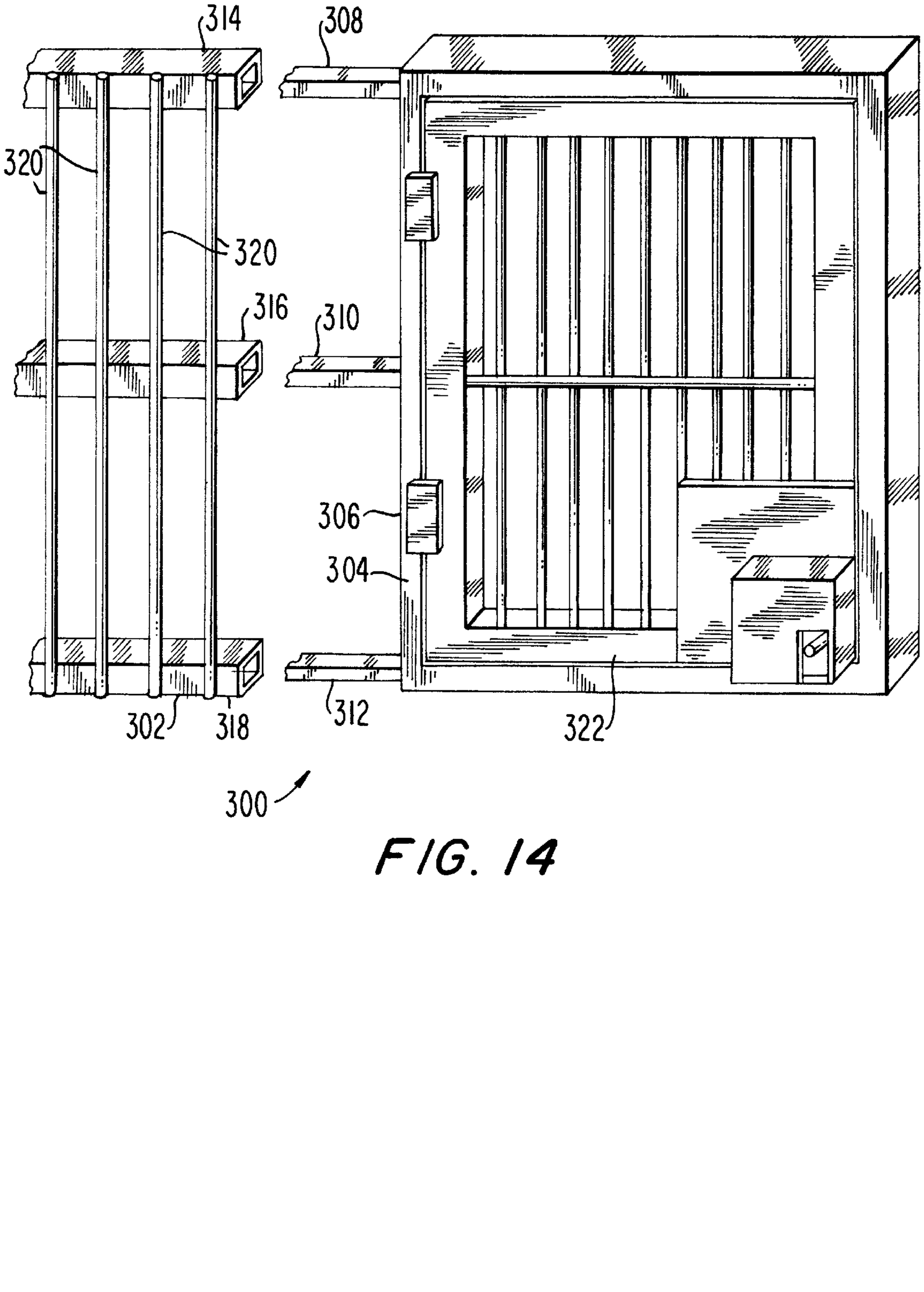

FIG. 14

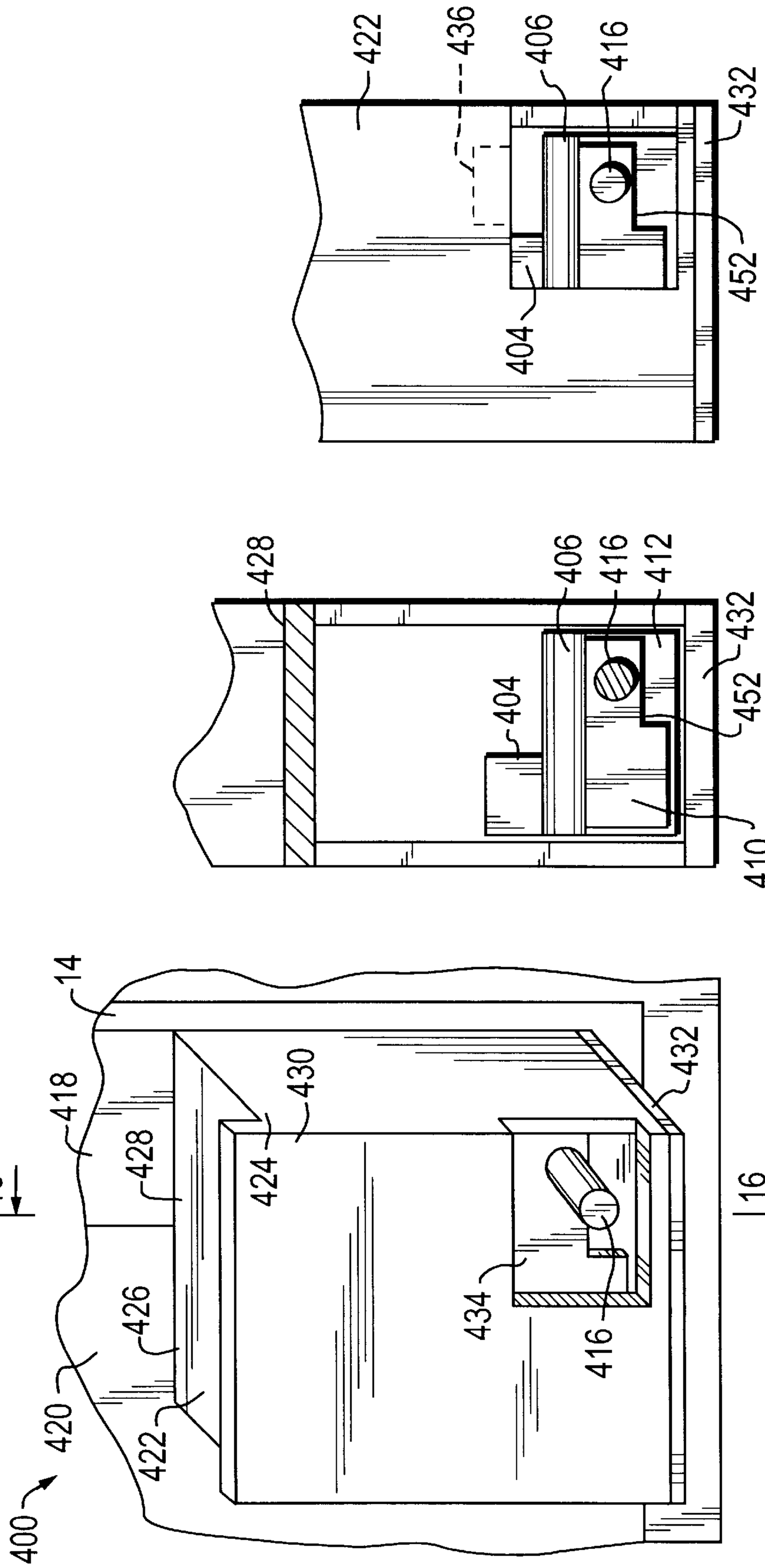

FIG. 15

FIG. 18

FIG. 19

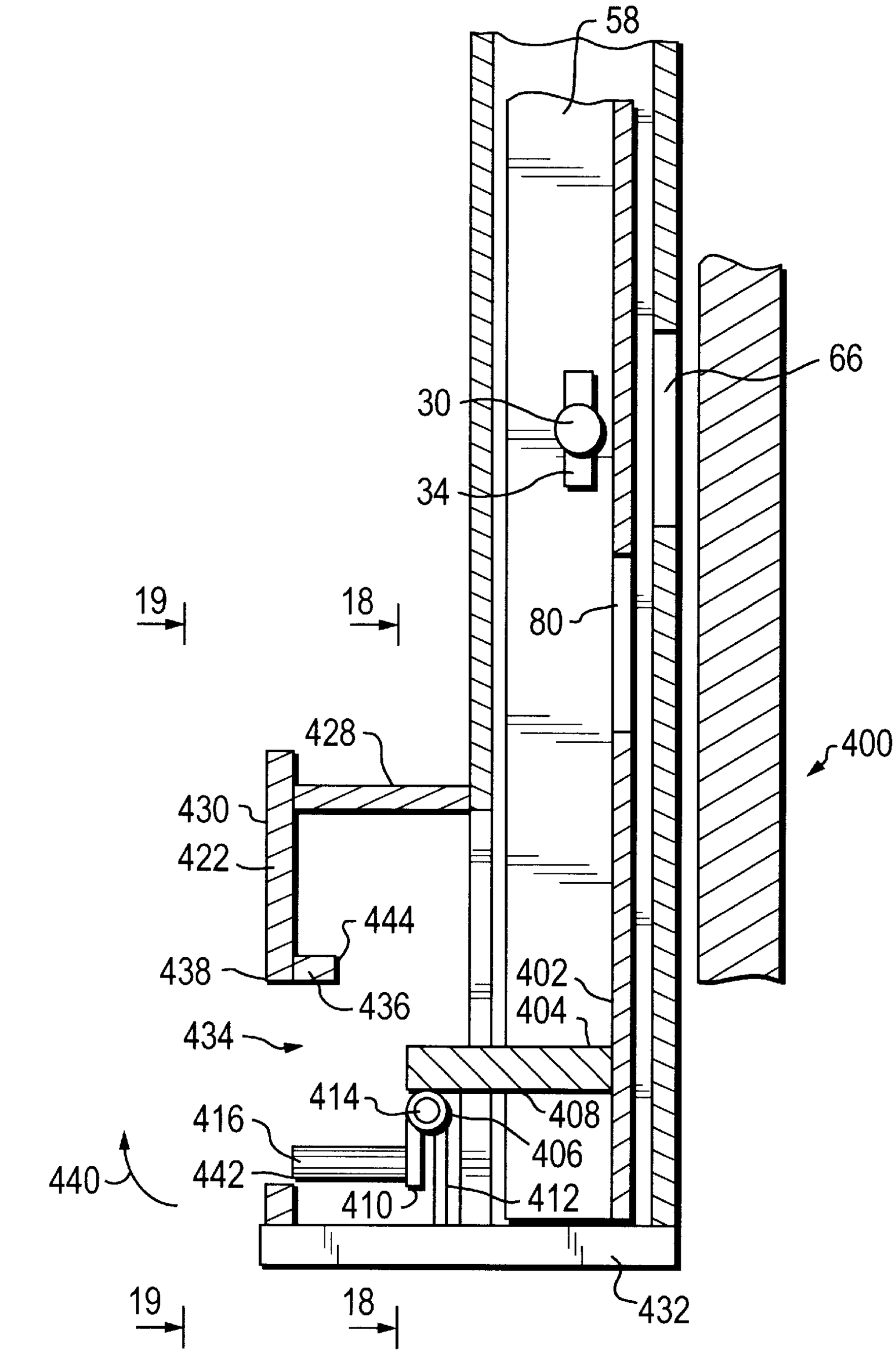
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FIG. 16

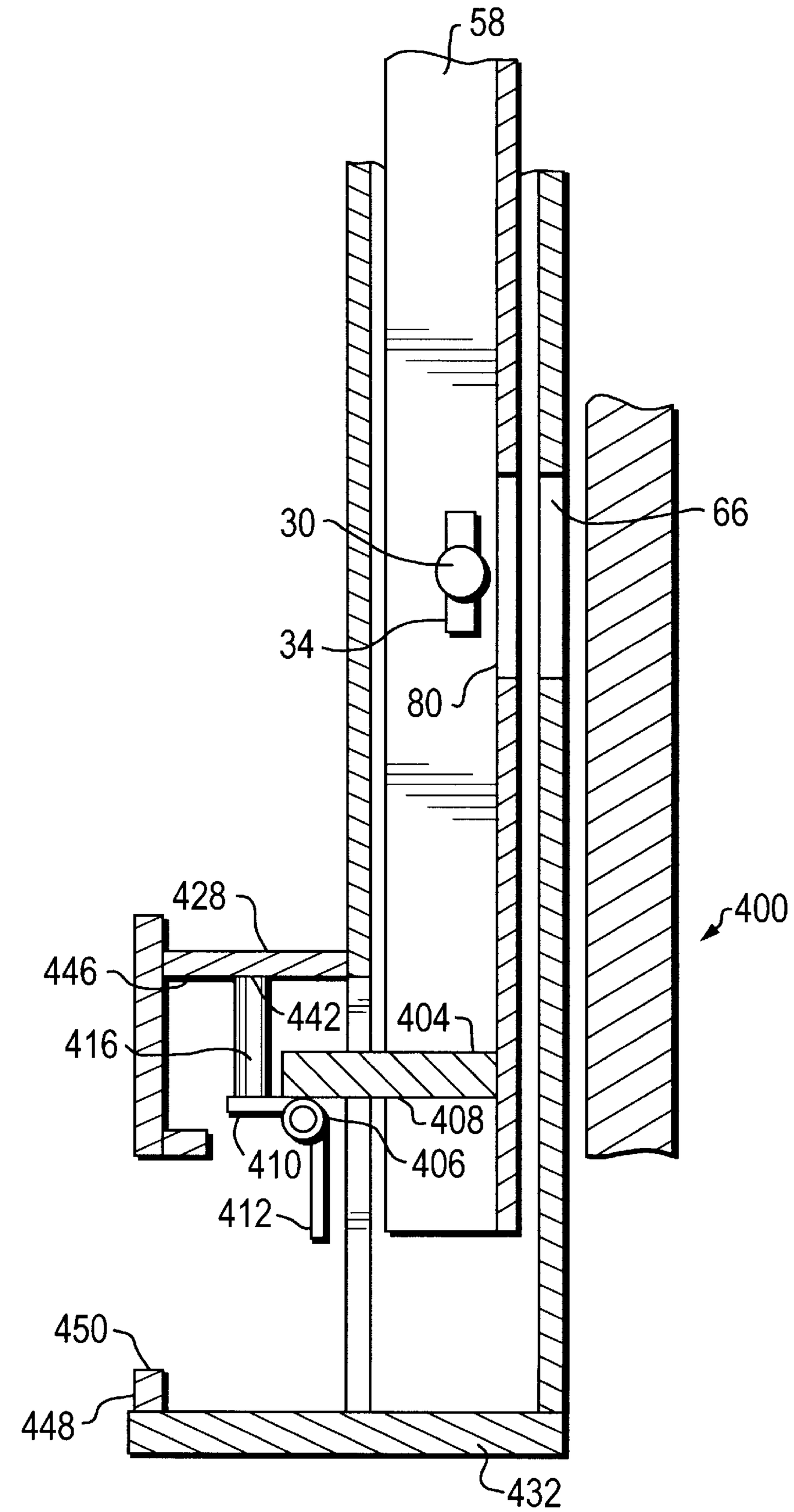

FIG. 17

WINDOW GATE APPARATUS

This application is a continuation-in-part application of my application Ser. No. 08/386,156 filed Feb. 9, 1995 now abandoned.

BACKGROUND OF THE INVENTION

The present invention relates generally to the field of window gates for ensuring the security of a dwelling against intruders and more particularly to a window gate apparatus which combines ease of operation with security against entry from the outside.

The prior art includes numerous examples of window gates which are intended to provide increased security to a dwelling by preventing unauthorized entry into the dwelling through a window. A key requirement for such window gates is a provision for simple operation from inside the dwelling because the window gate must be capable of being operated by a variety of individuals who may range from children to the elderly and infirm. The window gate must be capable of being easily operated in normal situations as well as during extreme situations such as fires or other emergencies. In addition, the window gate must provide a high degree of security against unauthorized entry from the outside including entry by persons who have available a range of burglar tools including a variety of hooks and picks.

The window gates in the prior art are all relatively complex devices which are not capable of meeting the generally conflicting requirements of ease of operation with security against intrusion.

OBJECT AND SUMMARY OF THE INVENTION

It is an object of the present invention to provide a window gate apparatus which can be operated easily from inside a dwelling.

Another object of the present invention is to provide a window gate apparatus which is secure against unauthorized entry from outside the dwelling.

Another object of the present invention is to provide a window gate apparatus which is of relatively simple construction thereby providing reliable operation for an extended period of time.

Yet another object of the present invention is to provide a window gate apparatus which is comprised of a relatively small number of relatively simple component parts resulting in a relatively low cost of manufacture.

The foregoing and other objects and advantages of the invention will appear more clearly hereinafter.

In accordance with the present invention, there is provided a window gate apparatus which includes an outer frame which is fastened to the window frame of a dwelling or other structure and an inner frame which is connected to the outer frame by a pair of hinges and by a lock assembly which forms a key feature of the present invention.

The lock assembly includes a lock rail which is slidably mounted in a hollow vertical frame member of the inner frame. The lock rail slides downward under the influence of gravity to a normally locked position in which portions of the lock rail engage on a pair of T bolts which are mounted on the outer frame and which project into the vertical frame member.

The lower portion of the lock rail includes a pivotally mounted pin which is horizontal when the lock rail is in the locked position and which must be moved upward to a vertical position thereby moving the lockrail upward to unlock the inner frame.

The window frame apparatus includes a shield plate and an enclosure, mounted on the inner frame which prevent grasping or pulling the pin from outside the window frame thereby preventing lifting the lockrail and unlocking the window gate apparatus.

DESCRIPTION OF THE DRAWINGS

Other important advantages of the invention will be apparent from the following detailed description taken in connection with the accompanying drawings in which:

FIG. **1** is an overall perspective view of a window gate apparatus made in accordance with the present invention, with the window gate apparatus shown in the closed position as it appears from inside a dwelling;

FIG. **2** is a cross-sectional view taken along the line **2—2** of FIG. **1** with the window gate apparatus shown in the locked position;

FIG. **3** is a cross-sectional view similar to FIG. **2** with the window gate apparatus shown in the unlocked position;

FIG. **4** is a fragmentary elevation view taken along the line **4—4** of FIG. **2**;

FIG. **5** is a view similar to FIG. **4** showing the window gate apparatus in the process of being opened;

FIG. **6** is a cross-sectional view taken along the **6—6** of FIG. **5**;

FIG. **7** is a cross-sectional view taken along the line **7—7** of FIG. **2**;

FIG. **8** is a cross-sectional view taken along the line **8—8** of FIG. **7**;

FIG. **9** is a perspective view of the end frame member of the window gate apparatus with the end frame member shown removed from the apparatus in order to show details of construction;

FIG. **10** is a perspective view of the end frame member similar to FIG. **9**, with a portion of the end frame member shown broken away to show details of construction of the locking rail;

FIG. **11** is a perspective view of the window gate apparatus of FIG. **1** with the window gate apparatus shown in the open position;

FIG. **12** is a fragmentary perspective view taken along the line **12—12** of FIG. **7**;

FIG. **13** is a cross-sectional view similar to FIG. **12** of an alternative embodiment of the window gate apparatus of FIG. **1** which incorporates a pin which projects into the building structure, and

FIG. **14** is a perspective view of another alternative embodiment of the window gate apparatus of FIG. **1** which incorporates an adjustably mounted section.

FIG. **15** is a fragmentary perspective view of yet another alternative embodiment of the window gate of FIG. **1**;

FIG. **16** is a cross-sectional view taken along the line **16—16** of FIG. **15** showing the window gate in the locked position;

FIG. **17** is a cross-sectional view, taken along the line **16—16** of FIG. **15**, similar to FIG. **16** showing the window gate in the unlocked position;

FIG. **18** is a cross-sectional view taken along the line **16—16** of FIG. **16**; and

FIG. **19** is a fragmentary front elevation view taken along the line **19—19** of FIG. **16**.

DETAILED DESCRIPTION OF THE INVENTION

With reference to the drawings there is shown in FIG. **1** a window gate apparatus **10**, made in accordance with the

present invention, which comprises an outer frame **12** and an inner frame **14**. The outer frame **12** includes a pair of spaced apart vertical members **16,18** and a pair of spaced apart horizontal members **20,22**. The horizontal members **20,22** and vertical members **16,18** are each formed as angle members each having a vertical leg and a horizontal leg indicated typically by the vertical **24** and horizontal leg **26**, as shown in FIG. **11**. The vertical member **16** includes a pair of T bolts **28,30** which engage and lock the outer frame **12** and the inner frame **14** in a manner which will be presently described. Each of the T bolts **28,30** has a horizontal portion **32** and a vertical portion **34**.

The inner frame **14** comprises a pair of spaced apart vertical members and a pair of spaced apart horizontal members **40,42**. The horizontal members **40,42** are formed as angle members each with a horizontal leg and a vertical leg as illustrated typically by the horizontal leg **44** and vertical leg **46** in FIG. **11**. The vertical members **36,38** are each formed as hollow square tubular members. The vertical member **38** of the inner frame **14** is attached to the vertical member **18** of the outer frame by a pair of hinges **48,50**.

The inner frame **14** includes a plurality of closely spaced vertical bars **52** and a horizontal bar **54** which form a grillwork and which cooperate to prevent entry into a dwelling or structure when the inner frame **14** is in the closed and locked position as is shown in FIG. **1**.

The lock assembly **56** which locks the inner frame **14** is best shown in FIGS. **2** and **3**. The lock assembly **56** includes a locking rail **58** which is slidably mounted in tubular vertical member **36** of the inner frame **14** as is shown in FIG. **2**. The walls **60,62** of the vertical member **36** include a pair of T shaped apertures **72,74** are each generally centered relative to the apertures **68,70** and the apertures **68,72** and the apertures **70,74** together form the generally T shaped apertures **64,66**. The apertures **64,66** are proportioned to accept the T bolts **28,30** which are mounted on the vertical member **16** and which project into the tubular member **36** as is shown in FIGS. **2,3** and **7**.

The locking rail **58** includes a pair of legs **76,78** which are generally mutually perpendicular. The leg **76** includes a pair of identical apertures **80** one of which is shown in FIG. **10**. The aperture **80** is proportioned to accept the T bolt **28** and to allow the projection of the T bolt **28** into the vertical member **36** when the apertures **80** in the locking rail **58** are in alignment with the apertures **64,66** in the vertical member **36**. When the locking rail **58** is allowed to move downward under the influence of gravity to a lower position as shown in FIG. **2**, the apertures **80** in the locking rail are displaced from the apertures **64,66** in the vertical member **36** as is shown, for example, in FIG. **2**, the aperture **80** is displaced from the aperture **66**. When the locking rail **58** is in the lower or locked position shown in FIG. **2**, the portion **82** of the locking rail **58** prevents the T bolt **30** from passing through the aperture **66** and thereby locks the inner frame **14** and the outer frame **12**.

The lower portion **84** of the locking rail **58** includes a projecting bracket member **86**. A hinge member **88**, which is attached to a lower surface **90** of the bracket member **86**, is attached to a pin member **92**. The hinge member **88** enables the pin member **92** to pivot relative to the locking rail **58** in a manner which will be presently described. The intermediate portion **94** of the pin member **92** includes a recess **96** or hook portion.

The lower portion **98** of the inner frame **14** includes a shield plate **100** and an enclosure **102**. The enclosure **102** includes a pair of side walls **104,106** a top wall **108**, a front wall **110** and a bottom wall **111**. The front wall **110** includes an aperture **112** which is in general alignment with the pin member **92** and which allows access to the pin member **92** from inside the dwelling.

The shield plate **100** and the enclosure **102** prevent access to the pin member **92** from outside the dwelling. If an intruder attempts to open the window gate apparatus **10** using a hook or other tool to grasp and lift the pin member **92**, the hinge **86** will allow the pin member **92** to pivot thereby rendering the hook useless. In addition, the front wall **110** of the enclosure **102** will prevent the lifting of the pin member **92**. The recess **96** on the pin member **92** acts as an additional safety device. As is shown in FIGS. **5** and **6**, if the pin member **92** is lifted by an intruder with the pin member **92** in an inclined position, rather than vertical, the recess **96** on the pin member **92** will engage the horizontal edge **114** of the vertical member **36** and vertical motion of the locking rail **58** will be prevented and the window gate apparatus **10** will remain locked.

The pivoting pin member **92** in combination with the enclosure **102**, the shield plate **100** and the vertical member **36** effectively prevent unwanted entry from outside the dwelling. The horizontal edge **114** is part of a relatively shorter aperture **116** which communicates with a relatively taller aperture **118** located on the lower portion **120** of the vertical member **36** as is shown in FIG. **10**.

Operation of the window gate apparatus **10** from inside the dwelling is extremely simple. The operator need only grasp the end **120** of the pin member **92** which is horizontal as is shown in FIG. **2** and move the pin member **92** in an upward direction to a vertical position as is shown in FIG. **3**. Lifting the pin member **92** also lifts the locking rail **58** and brings the aperture **80** in the locking rail **58** into alignment with the T bolt **30** as is shown in FIG. **3**. In this position the inner frame can be moved inwardly, in the direction indicated by the arrow **122** in FIG. **3** and the arrow **124** in FIG. **11** thereby unlocking and opening the window gate apparatus **10**.

The window gate apparatus **10** also includes a channel member **126** which is mounted on the vertical member **16** of the outer frame **12**. The channel member **126** includes three identical apertures **128** which are best illustrated in FIG. **12**. The apertures **128** facilitate forced entry by Fire Department personnel in the event of an emergency.

The top edge **150** of the front wall **110** of the enclosure **102** extends above top wall **108** and the side edge **152** of the enclosure **102** extends beyond the side wall **104** as shown in FIG. **1**. The edge, **150** and **152** can be used as handles to assist in opening the window gate apparatus **10**. This construction eliminates the need for an unsightly handle on the inside of the window gate apparatus **10**.

FIG. **13** shows an alternative embodiment of the window gate apparatus **200** which incorporates a plate **202** which is attached to the lower end **204** of the locking rail **212**. A pin **206** is attached to the plate **202** and the pin **206** projects into a hole **208** in the sill portion **210** of the dwelling. The pin **206** provides an added measure of security to the window gate apparatus **200**. When the locking rail **212** is lifted in order to unlock the window gate apparatus **200**, in the manner which has been previously described, the pin **206** is also lifted and the window gate apparatus **200** is opened as previously described.

FIG. **14** shows another alternative embodiment of the window gate apparatus which includes an adjustable gate portion **302**. As is shown in FIG. **14**, the vertical member **304** of the outer frame **306** includes three horizontal pro-

jecting members **308,310,312**. When the window gate apparatus **300** is installed, the projecting members **308,310,312** project into the inside of horizontal tubular members **314, 316,318** which forms a part of the adjustable gate portion **302**. The adjustable gate portion **302** also includes a plurality of vertical members **320** which are connected to the horizontal tubular members **314,316,318** and which form a grillwork to prevent unwanted entry when the window gate apparatus **300** is locked. The adjustable gate portion **302** permits the installation of the window gate apparatus **300** in windows of extended width without requiring the construction of an extremely large and heavy inner frame **322**.

FIGS. **15–18** show another alternative embodiment of the window gate apparatus **400** in which the lower portion **402** of the locking rail **58** includes a projecting bracket member **404** which replaces the projecting bracket member **86**, which has been previously described in connection with FIG. **2**. A hinge **406** is attached to the lower surface **408** of the bracket **404**. The hinge **406** includes a front leaf **410**, a rear leaf **412** and a hinge pion **414**. A pin member **416** is attached to the front leaf **410** and the hinge **406** enables the pin member **416** to pivot relative to the locking rail **58** in a manner which will be presently described.

The lower portion **418** of the inner frame **14** includes a shield plate **420** and an enclosure **422**. The enclosure **422** includes a pair of side walls **424, 426**, top wall **428**, a front wall **430** and a bottom wall **432**. The front wall **430** includes an aperture **434** which is in general alignment with the pin member **416** and which allows access to the pin member **416** from inside the dwelling.

The shield plate **420** and the enclosure **422** prevent access to the pin member **416** from outside the dwelling. If an intruder attempts to open the window gate apparatus **400** using a hook or other tool to grasp and lift the pin member **416**, the hinge **406** will allow the pin member **406** to pivot thereby rendering this hook useless.

The front wall **430** of the enclosure **422** includes a horizontal plate **436** which acts as an additional safety device. The plate **436** which is shown in FIGS. **16, 17** and **19** is located at the upper edge **438** of the aperture **434** in the front wall **430** and the plate **436** projects of the enclosure **422**.

The lip **448** which defines the lower edge **450** of the aperture **434** provides an additional measure of security since the user must insert the fingers of his or her hand into the aperture **434** in order to move the pin member **416** to the vertical position to unlock the window gate apparatus **400**. This lip **448** prevents an intruder from lifting the pin member from the outside of the dwelling using a hook or other tool inwardly toward the interior of the enclosure.

The plate **436** and the pin member **416** are proportioned such that a user can reach into the enclosure **422** and move the pin member **416** in the direction shown by the arrow **440** in FIG. **16**, thereby causing the end **442** of the pin member **416** to swing past the end **444** of the plate **436** to a generally vertical position. The user can then lift the locking rail **58** to the unlocked position as is shown in FIG. **17**. The notch **452** formed in the front leaf **410**, shown in FIGS. **18** and **19** allows the front leaf **410** to swing past the plate **436**.

As is shown in FIG. **17** the end **442** of the pin member **416** contacts the surface **446** of the top wall **428** thereby limiting the upward travel of the locking rail **58**. As is shown in FIG. **16**, when the locking rail **58** is in the lower position, the rear leaf **412** of the hinge **406** contacts the bottom wall **432**.

The foregoing specific embodiments of the present invention are for illustrative purposes only. Various changes and modifications may be made within the spirit and scope of the invention.

What is claimed is:

1. A window gate apparatus comprising:

outer frame means

inner frame means,

projecting means, mounted on said outer frame means and projecting into said inner frame means, hinged connection means connecting said outer and said inner frame means,

locking means reversibly locking said outer and said inner frame means with said locking means comprising,

a sliding locking rail with said sliding locking rail slidably mounted on said inner frame means and capable of a lower position engaging said projecting means and locking said inner frame to said outer frame and an upper unlocked position, with said locking rail having an upper end and a lower end,

a pin member with said pin member pivotally mounted on said lower end of said locking rail and engages said inner frame means,

barrier means mounted on said inner frame means, with said barrier means preventing entry through said window gate apparatus when said inner frame means is locked to said outer frame means.

2. A window gate apparatus according to claim **1** in which said projecting means comprises a T bolt.

3. A window gate apparatus according to claim **2** in which said inner frame means comprises a hollow member with said projecting means projecting into said hollow member.

4. A window gate apparatus according to claim **3** in which said locking rail is slidably mounted in said hollow member.

5. A window gate apparatus according to claim **1** in which said inner frame means further comprises a shield plate and an enclosure with said shield plate and said enclosure disposed proximate to said pin.

6. A window gate apparatus according to claim **5**, in which said enclosure further comprises an aperture portion with said aperture portion in general alignment with said pin.

7. A window gate according to claim **6** in which said enclosure further comprises

a front wall, with said front wall defining said aperture;

plate means, with said plate means disposed on said front wall and projecting inwardly relative to said enclosure.

8. A window gate according to claim **7** in which said plate means disposed on said front wall of said enclosure contacts said pin and prevents lifting of said sliding locking rail to said upper unlocked position unless said pin member is in said generally vertical position.

9. A window gate according to claim **5** in which said enclosure comprises an upper wall and in which said pin member is capable of a generally horizontal position and a generally vertical position, with said pin member having an end portion and with said end portion of said pin member contacting said top wall of said enclosure when said pin member is in said generally vertical position and said sliding locking rail is in said upper unlocked position.

10. A window gate apparatus according to claim **1** with said outer frame means further comprising an adjustably mounted grillwork panel.

11. A window gate apparatus according to claim **1** in which said lower end of said locking rail further comprises a pin member with said pin member mounted on said locking rail and projecting in general alignment with said locking rail.

12. A window gate according to claim **1** further comprising a hinge member mounted on said lower end of said locking rail and with said pin member mounted on said hinge member.

* * * * *